REMARKS

This application has been amended so as to place it in condition for allowance at the time of the next Official Action.

The Official Action states that the Information Disclosure Statement filed April 10, 2006 fails to comply with 37 CFR 1.98(a)(2). It is applicant's understanding that the Information Disclosure Statement in question is that of April 27, 2005.

The basis for this refusal of consideration is the assertion that the applicant failed to include a legible copy of each cited foreign patent document. Accordingly, the Examiner has not considered UK Patent Application GB 2 154 488 A. The two U.S. patent references identified in the Information Disclosure Statement have been considered.

As applicant originally noted on the Information Disclosure Statement as filed, the present application is a national phase of a PCT application. As also noted in the Information Disclosure Statement, reliance has been placed upon the terms of the trilateral agreement between the USPTO, EPO, and JPO. In accordance with such agreement, a national stage applicant is not required to provide copies of references cited in connection with international searches performed by the USPTO, EPO, or JPO. In the present case, the international search was performed by the EPO.

Accordingly, applicant fully met his obligations under U.S. law with the Information Disclosure Statement as originally filed. Accordingly, the USPTO is compelled to consider such timely-filed reference.

For the convenience of the Examiner, counsel for the applicant has since obtained a copy of the UK patent application in question, a copy of which is enclosed. The inclusion of such reference is not to be construed as an admission by the applicant that the Information Disclosure Statement as originally filed was in any way insufficient.

If the Examiner has any questions regarding this point of USPTO practice, the Examiner is invited to contact the undersigned directly.

The Official Action points out that the narrative portion of the specification fails to include the headings and subheadings generally used under U.S. practice. Accordingly, applicant has amended the specification as necessary so as to insert such headings. Reconsideration and withdrawal of this objection are therefore respectfully requested.

The Official Action notes that the application is in condition for allowance except for the issue of the asserted failure to include a copy of the foreign patent reference and the arrangement of the specification. The Official Action notes that prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*.

In light of this statement of the Official Action, and the amendments provided above, applicant believes that the present application is in condition for allowance and an early indication of the same is respectfully requested.

If the Examiner has any questions or requires further clarification of any of the above points, the Examiner may contact the undersigned attorney so that this application may continue to be expeditiously advanced.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following item:

- copy of UK Patent Application GB 2 154 488 A

(12) UK Patent Application (19) GB (11) 2 154 488 A

(43) Application published 11 Sep 1985

(21) Application No 8504309

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(31) 8404526 (32) 21 Feb 1984 (33) GB

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B24B 19/00 41/06 55/06

(52) Domestic classification
B3D 1D5B 2A11 2A13 2A15 2A20 2A21 2A8 2A9 2AX8 X25
U1S 1110 1807 B3D

(56) Documents cited
GB 1414718
GB 1380759
GB 0634156

(58) Field of search
B3D

(54) Grinding apparatus for de-charring whisky casks

(57) A machine for de-charring the inside of a used whisky cask (51) comprises a pair of chuck rings (4, 5) for gripping and rotating the cask about its axis while a counter-rotating flapper-type grinding wheel (43) is moved by a longitudinal feed carriage into the cask from one end in a direction which is slightly skew to the cask axis. The longitudinal feed carriage is mounted on a transverse feed carriage so that after entering the cask (51) the grinding wheel (43) can be moved laterally into engagement with the inside surface of the cask. When the grinding wheel (43) has been advanced half-way through the cask, the longitudinal feed carriage is reversed to retract the grinding wheel from the cask to allow the cask to be turned end to end for the operation to be repeated in order to de-char the other half of the cask.

For this purpose the machine has a support table (8) carrying a central turntable (9) and support cradle (10), a top clamp (11) for clamping a cask against the support cradle being provided.

The machine also has a loading fork (Figure 1) for lifting a cask from one side of the machine into position on the support cradle (10) and a dust extracting hood (46) and suction pipe are provided.

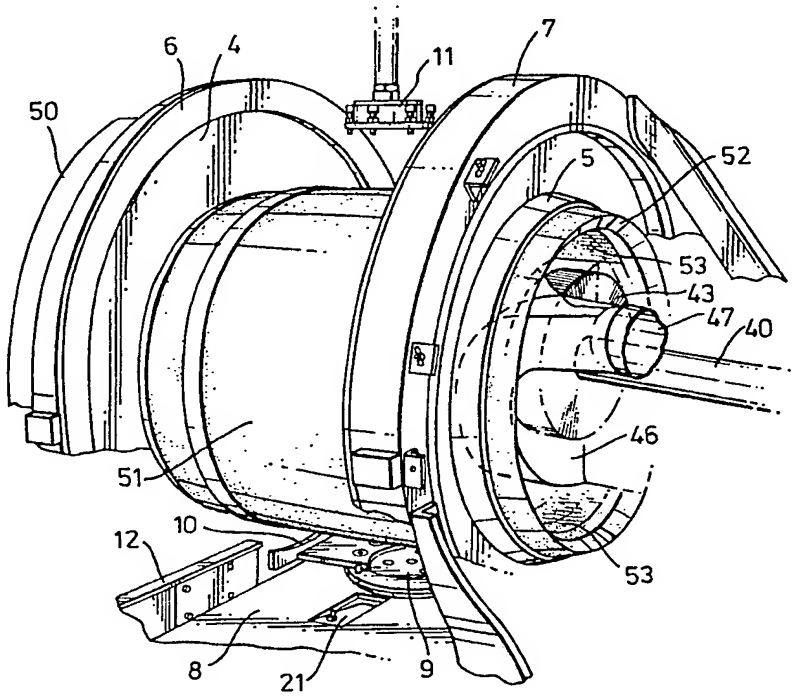

Fig. 3.

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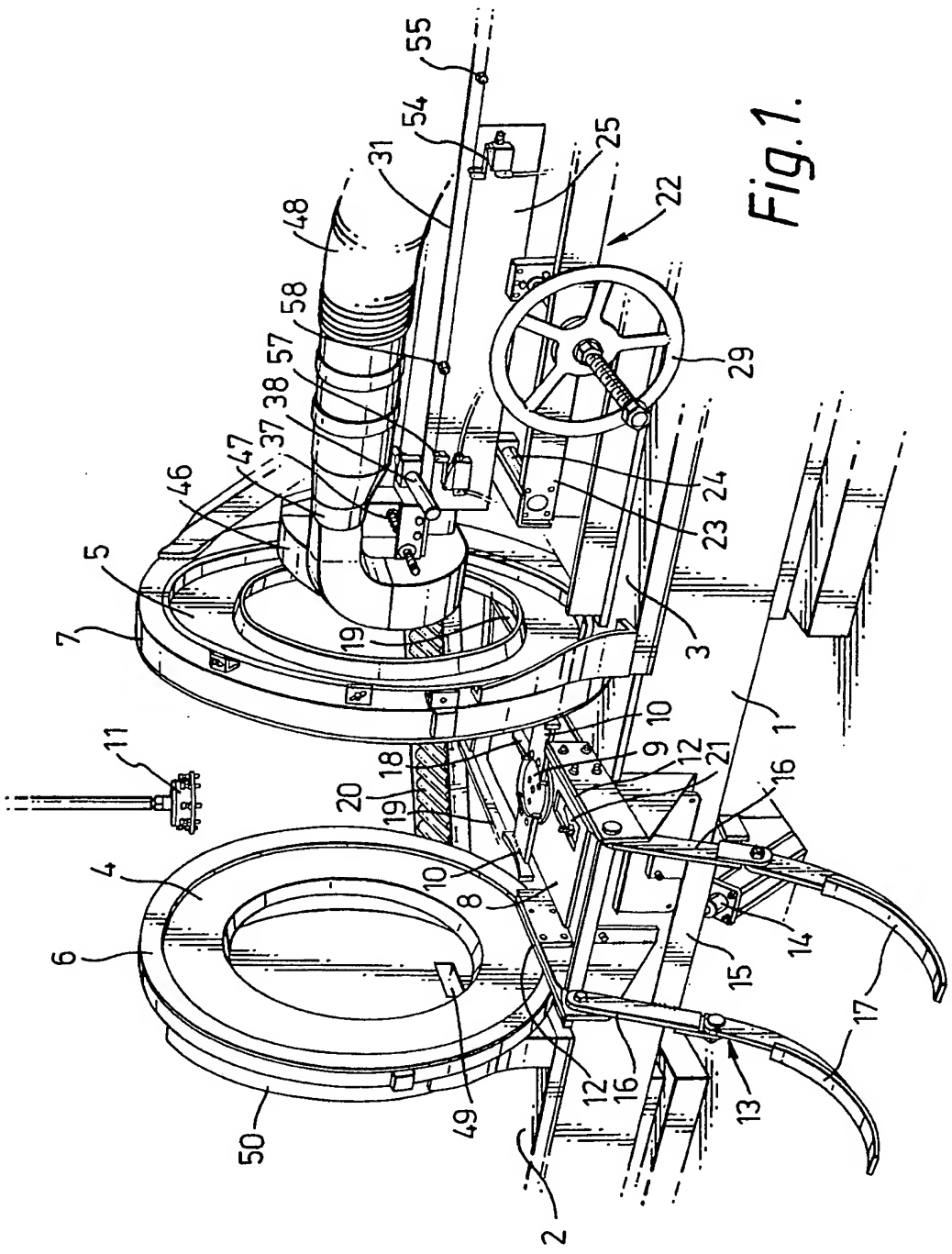
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Fig. 1.

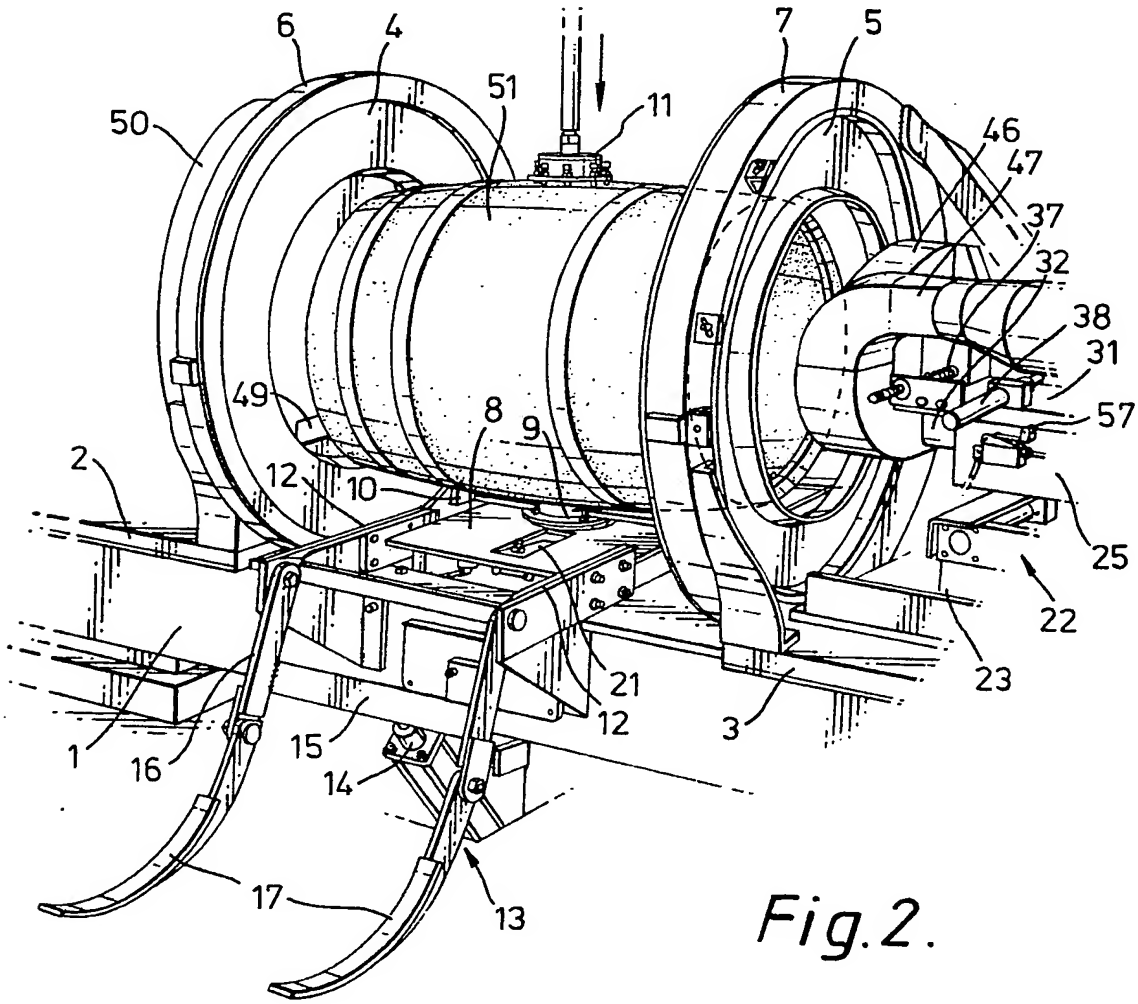
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Fig.2.

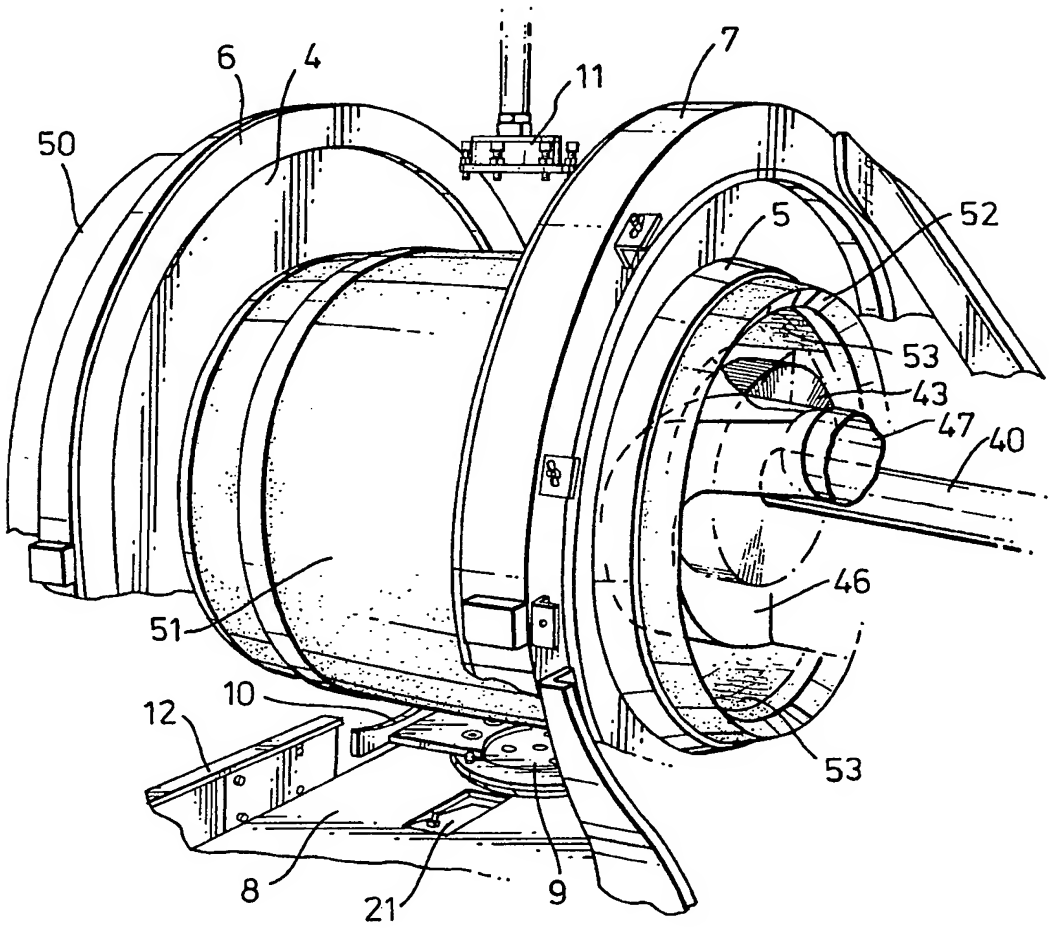

Fig. 3.

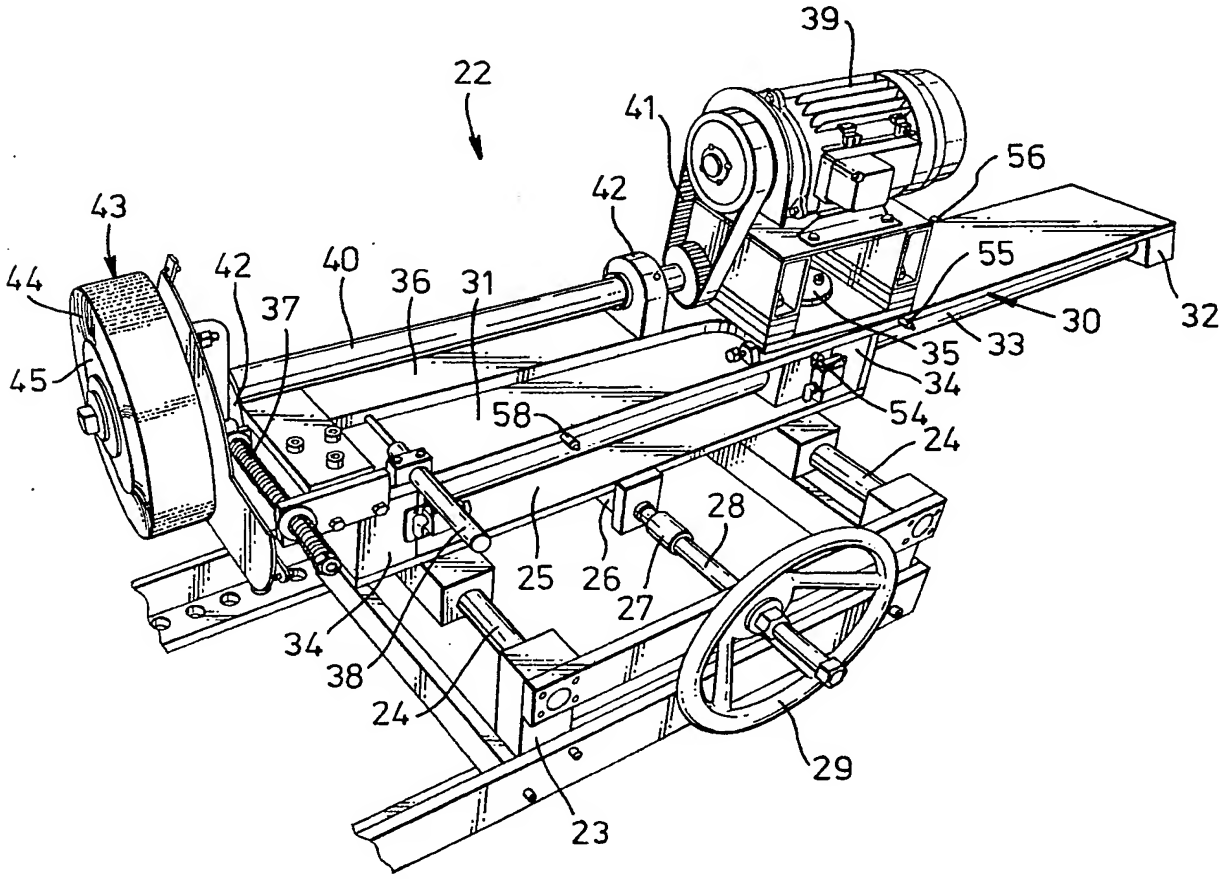
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Fig. 4.

SPECIFICATION

Apparatus for de-charring whisky casks

In the manufacture of scotch whisky the whisky is matured in oak casks which have generally had their inside surface charred. During the maturation process constituents in the charred surface of the wood react with the whisky to to improve its flavour, but after a cask has been used once or twice (or three times at the very most) the activity of the charred surface is spent. In the past new wood was continually added to the system to maintain the proportion of fresh charred wood, but consideration is now being given to extending the useful life of existing casks by removing the spent charred inner surface layer and then re-charring the inside of the cask.

With this in mind, according to the present invention, a machine for de-charring whisky casks or otherwise dressing the insides of wooden casks comprises means for holding and rotating a cask about its axis, a grinding wheel mounted on a feed carriage which is movable longitudinally with respect to the held cask to move the grinding wheel into and out of the cask through an open end thereof, means for moving the grinding wheel transversely with respect to the held cask to move the periphery of the grinding wheel into contact with the inside surface of the cask, and means for rotating the grinding wheel.

In operation the cask and the grinding wheel are rotated, preferably in opposite directions, and the periphery of the grinding wheel is caused to stay in contact with the inside surface of the cask as the grinding wheel is carried into and out of the cask by the longitudinal feed carriage so that the charred layer on the inside of the cask is abraded away. It will usually be convenient for the longitudinal feed carriage to carry the grinding wheel only half way through the cask before being retracted, and in order to de-char the other half of the cask, the cask is simply reversed end to end in the holding and rotating means and the grinding operation repeated.

Alternatively, a second grinding wheel may be mounted in a similar manner to the first but for operation from the opposite end of the cask held by the holding and rotating means, and preferably diametrically opposite the first grinding wheel. With this arrangement the two grinding wheels may be moved into and out of the cask to abrade its inner surface at substantially the same time, so that the whole cask is decharred in one operation, although some control would be necessary to ensure that the two wheels do not collide in the middle of the cask.

The longitudinal feed carriage may be moved by a fluid pressure operated ram, preferably a hydraulic ram, and a limit switch may be provided for automatically reversing the longitudinal feed carriage to move the grinding wheel back out of the cask when the carriage has advanced to a position in which the grinding wheel is half way through the cask.

Because of the tapered shape of the casks, the longitudinal feed carriage which carries the grinding wheel into and out of the cask held by the holding and rotating means is preferably arranged to move along a path which is angled slightly, for example about 10°, with respect to the axis of the held cask so that it follows more closely the line of the internal surface, thus making it easier for the periphery of the grinding wheel to be moved into and maintained in engagement with the inside surface of the cask during the travel of the longitudinal feed carriage.

The means for moving the grinding wheel transversely with respect to the held cask preferably comprises a transverse carriage on which the longitudinal carriage is mounted to move, and which is itself mounted to move (carrying with it the longitudinal feed carriage) in a direction which is transverse with respect to the cask axis and is preferably at right angles to the direction in which the longitudinal feed carriage moves relative to the transverse feed carriage. The transverse feed carriage may be moved by a fluid pressure operated ram, preferably a pneumatic ram, between operative and inoperative positions in which the grinding wheel is advanced towards or retracted from the inside of the cask respectively, and preferably the inoperative position is adjustable by means of a screw member which is connected to the ram and which is moved axially when a nut mounted thereon and provided with a hand wheel is turned by the machine operator. The ram which advances and retracts the transverse feed carriage may be operated by the machine operator or automatically in response to switches which are tripped by the longitudinal feed carriage at predetermined points in its travel into and out of the cask, for example at a position corresponding to where the grinding wheel is approximately in line with the croze of the cask.

Also, the grinding wheel is preferably mounted on the longitudinal feed carriage so that it is movable transversely relative to the longitudinal carriage, and is spring biassed so that, in operation, the grinding wheel is pressed by the spring against the inside of the cask when the transverse feed carriage is moved to advance the grinding wheel into contact with the cask. This arrangement enables the grinding wheel to move relative to both the longitudinal and transverse feed carriages, and thereby to maintain the periphery of the grinding wheel in contact with the inner surface of the cask despite the curved profile of the cask and any irregularities in the surface in the circumferential direction, although operator adjustment of the transverse feed carriage as described earlier may sometimes also be necessary, such as to counter wear of the grinding wheel.

Preferably the grinding wheel takes the form of an abrasive flap wheel, comprising a plurality of abrasive sheets, preferably flexible, extending radially from a hub to which they are fixed at their inner edges so that the abrasive faces of the sheets at their outer edges will scrape against the inside of the cask one after another as the wheel is ro-

tated. A grinding wheel of this construction has been found to be very satisfactory, de-charring the insides of casks efficiently and without producing unintentional score marks or other damage to the inside surface.

Preferably the machine includes means for collecting and conducting away the dust which is created during the de-charring of a cask by the grinding wheel.

The holding and rotating means of the machine may be similar to that which is used in conventional cask chimbing machines, comprising a pair of axially spaced parallel chuck rings which are arranged to be rotated in synchronism and which are relatively movable axially towards and away from each other respectively to clamp or release a cask held in the rings.

In a preferred construction, the machine comprises a loading fork which is movable between a lowered position at one side of the machine to allow a cask for decharring to be rolled onto the fork, and a raised position whereby the cask is lifted to a position where it rolls from the loading fork onto a support cradle which is positioned between the two chuck rings and is itself movable between a lowered position for receiving the cask to be decharred when the chuck rings are retracted, and a raised position in which it supports the cask in substantially co-axial alignment with the chuck rings so that advancement of the chuck rings towards each other will move the rings over the ends of the cask until the cask is clamped by the rings. Preferably the support cradle acts in conjunction with a top clamp for engaging the top of a cask supported on the cradle when the cradle is in its raised position, the top clamp being movable towards and away from the support cradle simultaneously with raising and lowering of the cradle respectively With such a construction, by arranging for the support cradle and the top clamp to be rotatable about a common axis perpendicular to that of the chuck rings, a cask held between the support cradle and the top clamp can be turned end to end through 180° on the support cradle when the chuck rings are retracted, thus facilitating the reversing of the cask in order to dechar the other half after the grinding wheel has been operated to dechar one half.

An example of a machine in accordance with the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a partial perspective view of the machine in its inoperative rest state;

Figure 2 is a perspective view, to a larger scale, of the cask holding and rotating section of the machine illustrating one stage of its operation;

Figure 3 is an incomplete view similar to that of Figure 2, but illustrating a further stage of its operation; and,

Figure 4 is a perspective view of the grinding wheel and its mounting assembly removed from the machine and with various cover plates removed to illustrate the construction more clearly.

The machine illustrated comprises a fixed base frame 1 on which a pair of spaced chuck ring carriages 2 and 3 are mounted and guided for movement towards and away from each other by operation of synchronised double-acting hydraulic rams (not shown) acting between the base frame 1 and the carriages 2 and 3 respectively. Each carriage 2, 3 carries an upright chuck ring 4, 5 which is co-axially aligned with the other and which is mounted to rotate about the axis within an annular housing 6, 7 fixed to the corresponding carriage 2, 3. The chuck rings 4 and 5 are arranged to be driven synchronously with each other by a suitable drive mechanism (not shown) mounted within the base frame.

Also mounted on the base frame 1, between the chuck ring carriages 2 and 3, is a lifting table 8 carrying at its centre a turntable 9 which is rotatable on the lifting table about a vertical axis intersecting the axis of the chuck rings and which itself carries a pair of diametrically opposite arms defining a support cradle 10 parallel to the axis of the chuck rings. The lifting table 8 (and with it the turntable 9 and support cradle 10) is arranged to be raised and lowered pneumatically simultaneously with the lowering and raising of a pneumatically operated top clamp 11 which is aligned with and rotatable about the turntable axis. The top clamp 11 is carried by an overhead frame (not shown) which also carries a panel mounting various controls for the machine.

At one side of the lifting table 8 the base frame 1 carries a pair of laterally extending parallel rails 12 having a loading fork 13 pivotally connected to their outer ends. The loading fork 13 is arranged to be raised and lowered by a pneumatic ram 14 acting on a cross member 15 of an upper frame portion 16 which is pivoted to the rails 12, and has a pair of curved tines 17 which are hinged to the upper frame portion 16 and which, in the lowered position of the fork 13 as shown, rest on the ground beside the machine, preferably in a shallow recess. The hinged connections of the tines 17 to the upper frame portion 16 allow independent movement of the tines relative to the upper frame portion in the lifting direction in case anything should get trapped beneath one of the tines when the fork is lowered, but prevent movement in the opposite direction beyond the positions shown. When the lifting fork 13 is raised, its upper frame portion 16 is raised to just above the level of the rails 12, and at the same time a stop flap 18 pivotally mounted in the lifting table 8 on the opposite side of the turntable 9 from the loading fork is also raised. This stop flap 18 is operated pneumatically and is raised and lowered simultaneously with the loading fork.

Supported on the base frame 1 on the opposite side of the lifting table 8 from the loading fork 13 is a further pair of rails 19 which extend from the table 8 laterally outwards towards a gravity roller discharge conveyor 20, and pivotally mounted in the lifting table 8 on the opposite side of the turntable 9 (i.e. on the same side as the loading fork) is an ejector flap 21 which can be raised and lowered pneumatically from the table 8.

Mounted on the chuck ring carriage 3 on the op-

posite side of the chuck ring from the central lifting table 8 and support cradle 10 is a grinding wheel assembly 22. This assembly, which is perhaps best illustrated in Figure 4, comprises a rigid rectangular frame 23 having a pair of parallel guide rods 24 on which a transverse feed carriage is mounted to slide in the direction of the guide rods 24 in response to actuation of a double-acting pneumatic ram 26 carried beneath the transverse feed carriage 25. The cylinder of the ram 26 is fixed to the underside of the carriage 25, and its piston rod is coupled at 27 to the end of an adjusting screw 28 which is mounted in the frame 23 so that it moves axially in response to the turning of a hand wheel 29 which is threaded on the screw 28. Consequently, turning of the hand wheel 29 also moves the transverse feed carriage 25 on its guide rods 24.

Mounted on the transverse feed carriage 25 is a longitudinal feed carriage which is movable horizontally back and forth on the transverse carriage in a direction which is perpendicular to that in which the transverse carriage moves along the guide rods 24. The longitudinal feed carriage 30 comprises a platform 31 which is fitted on a pair of end blocks 32 between which a pair of parallel slide rods 33 (only one shown) extend through two pairs of guide sleeve blocks 34 mounted at opposite ends of the transverse feed carriage 25. The longitudinal feed carriage 30 is moved by means of a double-acting hydraulic ram (not shown) having its cylinder fixed between the guide sleeve blocks 34 on the transverse carriage 25 and its piston rod coupled to one of the end blocks of the longitudinal carriage.

Pivotally mounted on a circular pivot block 35 at about the centre of the longitudinal feed carriage platform 31 is one end of a drive support plate 36 which extends along the platform 31 to one end thereof where the support plate 36 is spring biassed slightly to one side of the platform 31 by means of a spring 37. Also mounted on the platform 31 and arranged to act on the support plate 36 in conjunction with the biassing spring 37 is a hydraulic damper 38. Mounted on the support plate 36 at its pivoted end is an electric motor 39 arranged to drive a shaft through a toothed belt 41. The shaft 40 is rotatably mounted in bearings 42 fixed on the support plate 36 and extends along the plate 36 so that its end remote from the drive belt 41 projects beyond the end of the support plate 36 and platform 31 and carries a grinding wheel 43 in the form of an abrasive flap wheel of the type described earlier. As can be seen, the grinding wheel 43 comprises a multitude of similar rectangular flexible flaps or sheets 44 of abrasive material extending radially from a hub 45 to which the inner edges of the flaps are fixed.

As shown in Figure 1, the frame 23 of the grinding wheel assembly 22 is fixed on the chuck ring carriage 3 in a position such that with the transverse and longitudinal feed carriages 25 and 30 retracted, the grinding wheel 43 is spaced rearwardly from the chuck ring 5 and in a position to pass through the chuck ring when the longitudinal feed carriage is advanced. The grinding wheel assembly 22 is in fact mounted slightly skew on the carriage 3 so that the axis of the longitudinal feed carriage (i.e.the direction in which it is advanced and retracted) is angled at about 10° to the axis of the chuck rings 4 and 5.

Although not clearly shown, in the completed grinding wheel assembly 22 the transverse and longitudinal feed carriages 25 and 30 are provided with side cover plates, and the driving belt 41 and the shaft 40 are covered by suitable guards. Also, the grinding wheel 43 is arranged to rotate within a hood 46 from which a portion of the periphery of the grinding wheel projects in the direction towards which the support plate 36 is biassed. The hood 46 is carried by the support plate 36 and includes a tubular portion 47 connected to a flexible suction pipe 48 for removing dust created by the grinding wheel during operation of the machine. A further suction pipe (not shown) for this purpose is connected to an opening 49 in a cover plate 50 which is attached to the chuck ring housing 6 to cover the opening through the corresponding chuck ring 4 at its outer end.

In operation, starting from the rest position shown in Figure 1, a cask 51 to be decharred is rolled centrally onto the tines 17 of the lifting fork 13 resting in the floor recess. The operator then actuates the pneumatic rams to raise the lifting fork 13 and the stop flap 18 so that the cask is lifted by the fork 13 until its rolls from the fork inwards onto the rails 12 and then onto the support cradle 10 where it is stopped by engagement with the stop flap 18. The lifting table 8 is then actuated to raise the cask, and the top clamp 11 simultaneously lowered, to the position shown in Figure 2 in which the cask 51 is clamped between the support cradle 10 and the top clamp 11 at a level at which the cask is substantially co-axially aligned with the chuck rings 4 and 5. During this step the lifting fork 13 and the stop flap 18 return automatically to their lowered positions. The operator then advances the chuck ring carriages 2 and 3 towards each other by actuating their drive rams until the chuck rings 4 and 5 move over the ends of the cask 51 and grip tightly around the outside of the cask. The operator then stops the carriages 2 and 3 in this position and retracts the support cradle 10 and the top clamp 11 from the cask by lowering the lifting table 8 and raising the top clamp 11.

The chuck ring drive and the grinding wheel motor 39 are then switched on to set the cask 51 and the grinding wheel 43 rotating in opposite directions, and the operator actuates the longitudinal feed carriage ram to start the carriage 30 moving the grinding wheel 43 towards the adjacent open end of the cask 51 projecting through the chuck ring 5 as shown at 52 in Figure 3. The speed of the longitudinal feed carriage 30 is set by adjustable flow restrictors in the hydraulic lines to the opposite ends of the cylinder. When the grinding wheel 43 has advanced into the cask 51 to a point just beyond the croze the operator actuates the transverse feed carriage ram 26 to move the longitudinal feed carriage sideways so that the periphery of

the grinding wheel 43 is brought into engagement with the inside 53 of the cask, the support plate 36 pivoting slightly against the biassing action of the spring 37. If desired, the transverse feed carriage ram 26 may be arranged to be actuated automatically when the longitudinal feed carriage reaches the desired position, for example by engagement of a limit switch 54 mounted on the transverse carriage 25 by an actuator 55 carried by the longitudinal carriage platform 31. The longitudinal feed carriage 30 continues to advance the grinding wheel 43 into the cask 51, and the combination of this movement and the rotation of the grinding wheel 43 in contact with the surface 53 of the rotating cask causes the grinding wheel to wear away the charred inner surface layer of the cask.

When the grinding wheel 43 reaches the centre of the cask the longitudinal feed carriage is reversed by switching the hydraulic supply to its feed ram, either by operator control or automatically in response to engagement of a limit switch (not shown) on the transverse carriage 25 by a suitably placed actuator 56 on the longitudinal feed platform 31. The grinding wheel 43 also acts on the inside 53 of the cask as the longitudinal feed carriage 30 is retracted, and when the grinding wheel reaches the open end 52 of the cask the transverse feed carriage 25 is retracted to retract the grinding wheel 43 from the side of the cask, again either by operator control or automatically in response to engagement of a limit switch 57 by an actuator 58 carried by the longitudinal feed platform 31.

When the longitudinal feed carriage is fully retracted, the operator turns off the grinding wheel motor 39 and the cask rotator, and then operates the lifting table 8 and top clamp 11 so that the support cradle and clamp 11 are raised and lowered respectively into engagement with the cask. With the cask held in this way the chuck rings 4 and 5 are retracted clear of the ends of the cask to allow the cask to be rotated through 180° on the turntable 9, and the cask is thereby reversed end to end. This rotation of the cask may be carried out by hand, but if desired the rotation can be effected automatically by means of a pneumatic ram acting on either the top clamp 11 or the turntable 9. After reversing the cask 51 the chuck rings 4 and are once again advanced to grip the outside of the cask, the top clamp 11 and the lifting table 8 are raised and lowered respectively, and the machine is operated to dechar the other half of the cask in the same way as the first half.

It has been found that a satisfactory decharring of a cask can be achieved in a single pass of the grinding wheel 43 into and back out of the cask for each half of the cask, but if considered necessary further passes can of course be carried out.

During the decharring operation, the dust which is created by the action of the grinding wheel 43 on the inside of the cask is sucked away by means of the suction pipe 48 connected to the hood 46 around the grinding wheel, and by means of the suction pipe communicating with the inside of the cask through the opening 49 in the plate 50 which covers the other end of the cask.

On completion of the decharring operation the chuck ring drive and the grinding wheel motor 39 are switched off, and the lifting table 8 and top clamp 11 actuated to grip the cask while the chuck ring carriages are retracted to release the chuck rings from the cask. The lifting table 8 is then lowered and the ejector flap 21 actuated to push the cask 51 off the support cradle 10 onto the rails 19 so that it rolls along the rails and onto the discharge conveyor 20 which carries it away from the machine.

CLAIMS

1. A machine for decharring whisky casks, or otherwise dressing the insides of wooden casks, comprising means for holding and rotating a cask about its axis, a grinding wheel mounted on a feed carriage which is movable longitudinally with respect to the held cask to move the grinding wheel into and out of the cask through an open end thereof, means for moving the grinding wheel transversely with respect to the held cask to move the periphery of the grinding wheel into contact with the inside surface of the cask, and means for rotating the grinding wheel.

2. A machine according to Claim 1, in which the held cask and the grinding wheel are arranged to be rotated in opposite directions.

3. A machine according to Claim 1 or Claim 2, in which the longitudinal feed carriage is moved by a fluid pressure operated ram.

4. A machine according to Claim 3, in which the speed at which the longitudinal feed carriage is moved is adjustable by means of adjustable flow restrictors in the fluid pressure lines to the opposite ends of the ram cylinder.

5. A machine according to any one of the preceding Claims, including a limit switch which is operative automatically to reverse the longitudinal feed carriage and thereby move the grinding wheel back out of the cask when the carriage has advanced to a position in which the grinding wheel is half way through the cask.

6. A machine according to any one of the preceding Claims, in which the longitudinal feed carriage is arranged to move along a path which is angled with respect to the axis of the held cask.

7. A machine according to Claim 6, in which the path of the longitudinal feed carriage is angled at about 10° to the axis of the held cask.

8. A machine according to any one of the preceding Claims, in which the means for moving the grinding wheel transversely with respect to the held cask comprises a transverse carriage on which the longitudinal carriage is mounted to move, and which is itself mounted to move (carrying with it the longitudinal feed carriage) in a direction which is transverse with respect to the cask axis.

9. A machine according to Claim 8, in which the transverse carriage moves in a direction which is at right angles to the direction in which the longitudinal feed carriage moves relative to the trans-

verse carriage.

10. A machine according to Claim 8 or Claim 9, in which the transverse carriage is moved by a fluid pressure operated ram between operative and inoperative positions in which the grinding wheel is advanced towards or retracted from the inside of the cask respectively.

11. A machine according to Claim 10, in which the inoperative position of the transverse carriage is adjustable by means of a screw member which is connected to the ram and which is moved axially when a nut mounted thereon and provided with a hand wheel is turned by the machine operator.

12. A machine according to Claim 10 or Claim 11, in which the ram which advances and retracts the transverse carriage is arranged to be operated automatically by switches which are tripped by the longitudinal feed carriage at predetermined positions in its travel into and out of the cask.

13. A machine according any one of Claims 8 to 12, in which the grinding wheel is mounted on the longitudinal feed carriage so that it is movable transversely relative to the longitudinal carriage, and the grinding wheel is spring biased so that, in operation, it is pressed by the spring against the inside of the cask when the transverse carriage is moved to advance the grinding wheel into contact with the cask.

14. A machine according to Claim 13, in which the grinding wheel is mounted at one end of a support plate which is pivotally mounted on the longitudinal feed carriage and which also carries the means for rotating the grinding wheel, and the biasing spring for pressing the grinding wheel against the inside of the cask acts on the pivoted support plate.

15. A machine according to Claim 14, in which a hydraulic damper acts on the pivoted support plate in conjunction with the biasing spring.

16. A machine according to any one of the preceding Claims in which the grinding wheel is an abrasive flap wheel comprising a plurality of flexible abrasive sheets extending radially from a hub to which they are fixed at their inner edges so that the abrasive faces of the sheets at their outer edges will scrape against the inside of the cask one after another as the wheel is rotated.

17. A machine according to any one of the preceding Claims, comprising means for collecting and conducting away dust which is created during decharring of a cask by the grinding wheel.

18. A machine according to any one of the preceding Claims, in which the means for holding and rotating a cask about its axis comprises a pair of axially spaced parallel chuck rings which are arranged to be rotated in synchronism and which are movable axially towards and away from each other respectively to clamp or release a cask held in the rings.

19. A machine according to Claim 18 when dependent upon Claim 17, in which the dust collecting and conducting means comprises a suction pipe connected to an opening in a cover plate for covering the end of a cask clamped in the chuck rings remote from the end into which the grinding wheel is moved.

20. A machine according to Claim 19, in which the dust collecting and conducting means comprises a further suction pipe which is connected to a dust collecting hood mounted around the grinding wheel.

21. A machine according to any one of Claims 18 to 20, comprising a support cradle which is positioned between the two chuck rings and which is movable between a lowered position for receiving a cask to be decharred when the chuck rings are retracted, and a raised position in which it supports the cask in substantially co-axial alignment with the chuck rings so that advancement of the chuck rings towards each other will move the rings over the ends of the cask until the cask is clamped by the rings.

22. A machine according to Claim 21, comprising a top clamp for engaging the top of a cask supported on the cradle when the cradle is in its raised position, the top clamp being movable towards and away from the support cradle simultaneously with raising and lowering of the cradle.

23. A machine according to Claim 22, in which the support cradle and the top clamp are rotatable about a common axis to turn a cask end to end when the support cradle is raised and the chuck rings are retracted.

24. A machine according to any one of Claims 21 to 23, comprising a loading fork which is movable between a lowered position at one side of the machine to allow a cask for decharring to be rolled onto the fork, and a raised position whereby the cask is lifted to a position where it rolls from the loading fork onto the support cradle.

25. A machine according to Claim 24, comprising a stop flap which is raised simultaneously with the loading fork on the opposite side of the support cradle to prevent a cask rolling beyond the support cradle from the loading fork, the stop flap being lowered when the loading fork is lowered.

26. A machine according to Claim 24 or Claim 25 in which the loading fork comprises a pivoted frame which is raised and lowered to raise and lower the fork, and a pair of tines which are hinged to the frame to permit independent movement of the tines relative to the frame in the lifting direction.

27. A machine according to any one of Claims 24 to 26, comprising an ejector flap which is movable up and down between the support cradle and the loading fork, and which can be raised when the support cradle is lowered and the chuck rings retracted to push a cask off the support cradle in a direction away from the loading fork to discharge the cask from the machine.

28. A machine according to Claim 1, substantially as described with reference to the accompanying drawings.

Amendments to the claims have been filed, and have the following effect:-

(a) Claims 1, 8 & 13 above have been deleted or textually amended.

(b) New or textually amended claims have been filed as follows:-

(c) Claims 9 to 12 & 14 to 28 above have been re-numbered as 8 to 11 & 12 to 26

1. A machine for decharring whisky casks, or otherwise dressing the insides of wooden casks, comprising means for holding and rotating a cask about its axis, a grinding wheel mounted on a feed carriage which is movable longitudinally with respect to the held cask to move the grinding wheel into and out of the cask through an open end thereof and which is itself mounted on a carriage which is movable transversely with respect to the held cask to move the periphery of the grinding wheel into contact with the inside surface of the cask, and means for rotating the grinding wheel,the grinding wheel being mounted on the longitudinal feed carriage so that it is movable transversely relative to the longitudinal carriage and being spring biased so that, in operation, it is pressed by the spring against the inside of the cask when the transverse carriage is moved to advance the grinding wheel into contact with the cask.

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